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ABSTRACT

This teacher's resource guide was created to accompany the Amazon Flooded Forest exhibit at the Oregon Zoo. The enclosed lessons and activities are designed to extend into several aspects of daily curriculum including science, math, reading, writing, speaking, and geography. The materials are intended for use in grades 3-6 although most activities can easily be adapted to meet the needs of other classes. Within each thematic section is found age-appropriate information on the flooded forest as well as a variety of activities for use in the classroom. There is also a series of reproducible worksheets complete with instructions incorporated onto each sheet. A guide for chaperones to use with their groups on visits to the zoo is also included. Activities include: (1) "Compare and Contrast a Flooded Forest and a Coniferous Forest"; (2) "Track the Weather-Here At Home and In the Amazon"; (3) "Map the Amazon River Basin" (worksheet); (4) "Lead a Research Expedition into the Flooded Forest"; (5) "Explore the Concept of Natural Cycles" (worksheet); (6) "Learn How Flooding and Fire Can Be a Good Thing"; (7) "Apply Estimating and Measurement Skills to the Flooded Forest" (worksheet); (8) "Make a Rain Stick"; (9) "Create an Amazon Flooded Forest Habitat" (worksheet); (10) "Research, Write and Illustrate an Amazon A-to-Z Book"; (11) "Amazon Flooded Forest Word Search"; (12) "Identify Niches in the Amazon Flooded Forest" (worksheet); (13) "Write a First-Person Story About an Amazon Animal"; (14) "Explore a Mini Ecosystem"; (15) "Create Camouflage for a Poison Dart Frog" (clip art); (16) "Compare Amazon and Northwest Animals" (worksheet); (17) "Build Amazon Flooded Forest Food Chains" (worksheet); (18) "Write a Dr. Seuss-Like Story or Poem About the Flooded Forest"; (19) "Create a First-Person Amazon Journal or Diary"; (20) "Make a Ron- Ron Toy"; (21) "Compare and Contrast Life Here with Life in the Flooded Forest"; (22) "Amazon Vocabulary Words"; (23) "Raise Cardinal Tetras in Your Classroom"; (24) "Brainstorm Positive Ways to Use the Flooded Forest"; (25) "Who's Who in the Amazon Flooded Forest" (worksheet); (26) "Teacher Resources"; and (27) "Field Trip Questions" (worksheet for chaperones). (MVL)

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OREGON ZOO

AMAZON FLOODED FOREST

Teacher Resource Guide

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This chart shows how the concepts and activities addressed in this resource guide have been correlated with Oregon benchmarks and Washington EALRS.

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INTRODUCTION

This teacher's resource guide was created to accompany the Amazon Flooded Forest exhibit at the Oregon Zoo. The enclosed lessons and activities are designed to extend into several aspects of daily curriculum, including science, math, reading, writing, speaking and geography. The materials included are intended for use in grades three through six, although most activities can easily be adapted to meet the needs of your class.

Within each thematic section, you will find age-appropriate information on the flooded forest, as well as a variety of activities for use in your classroom. You will also find a series of reproducible worksheets, complete with instructions incorporated onto each sheet. Plus a guide for chaperones to use with their groups on visits to the zoo.

To give your students the ultimate hands-on experience, turn your classroom into an Amazon flooded forest. It can be as simple as a work-in-progress flooded forest bulletin board, or as in-depth as a room-sized 3-D flooded forest — complete with giant trees, paper mache animals and fish swimming from the ceiling. Be creative and have fun!

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WHAT'S A FLOODED FOREST?

It's rainy season in the Amazon and the animals are on the move. Over the next few months, the water level will rise from the riverbed all the way to the tree-tops. Welcome to the Amazon flooded forest — home to fruit-eating fish, giant rodents, tiny monkeys, poisonous frogs, 400-pound snakes, bugs by the millions and more. Enjoy your visit!

Key Concepts

Throughout this resource guide, as well as in the Amazon Flooded Forest exhibit at the Oregon Zoo, a variety of key concepts are discussed and explored. This includes natural cycles, adaptation, diversity, interconnectedness and the fact that in this environment, flooding is a GOOD thing. Ultimately, students will learn that the Amazon flooded forest is one of the most biologically diverse ecosystems in the world.

ACTIVITY 1

Compare and contrast a flooded forest and a coniferous forest.

Have the students compare the flooded forest of the Amazon River area with the coniferous forest of the Pacific Northwest. Use brainstorming, diagrams, art, writing and other compare and contrast methods. Areas to discuss include wildlife, weather, types of trees, types of foliage, seasons and location.

ACTIVITY 2

Compare and contrast weather elements from different environments.

Have students compare and contrast the rainfall and temperature in their city with that of a city in the Amazon flooded forest. Larger cities in the area include Belem and Manaus (both in Brazil) and Iquitos, Peru. Data can be collected via newspaper weather page and/or Internet for a pre-determined time (five days, one week, ten days). Chart or graph results.

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AMAZON FLOODED FOREST

The Amazon flooded forest, located primarily in Brazil, is a type of tropical rain forest. This forest has more than 100 different tree species per acre, but may have only one or two of each type of tree. The upper canopy can reach more than 165 feet high. Seasons are marked by rising and lowering water levels. Trees have adapted to being partially underwater for months at a time.

CONIFEROUS FOREST

The coniferous forest, like those found throughout the Pacific Northwest, is a type of temperate evergreen forest. This forest has only a few tree species per acre, but has hundreds of each type of tree. Evergreen trees with needles and cones are dominant. Seasons are marked by distinct changes in temperature. Evergreen trees thrive in areas with mild winters with heavy rainfall.

WHERE IN THE WORLD?

The Amazon River flows through the heart of South America, running mainly through the country of Brazil. Tens of thousands of smaller streams and rivers (called tributaries) empty into the Amazon, creating an area known as the Amazon River basin.

During much of the year, heavy rains cause the basin to flood. This sends water deep into the forest, with the water level sometimes rising as high as 50' into the trees.

ACTIVITY 3

Learn about the geographical region of the Amazon River basin.

Use the blank map on the next page as a pre/post test for this unit. Have students identify 3 key areas:

* Amazon River and some of its main tributaries
* countries in the region
* cities in the area

The small map included here can be enlarged and used as a guide. You can also use a classroom wall map of the area as a resource.

ACTIVITY 4

Lead a research expedition into the Amazon flooded forest.

Divide the class into groups of 3-5 students. Tell the groups that they will each be going on a research expedition to the Amazon flooded forest. But before they can set off for Brazil, they will need to do some prep work. Each group will need to brainstorm and create the following:

* Expedition goals — what do they want to research in the flooded forest ... and why?
* Expedition supply list — what sorts of things do they need to take on the expedition ... and why? Things to consider include weather, climate and roads.
* Expedition route — how will they get from home base (school) to the Amazon flooded forest? Will it be via car, train, airplane, boat or combination? How will their mode of transportation affect their supply list? Have them make a map of their proposed route using globes, atlases, www.mapquest.com and other reference materials.

Projects can incorporate writing, charts, pictures, props and so on. Once the projects are done, have each group present their expedition's plans to the class.

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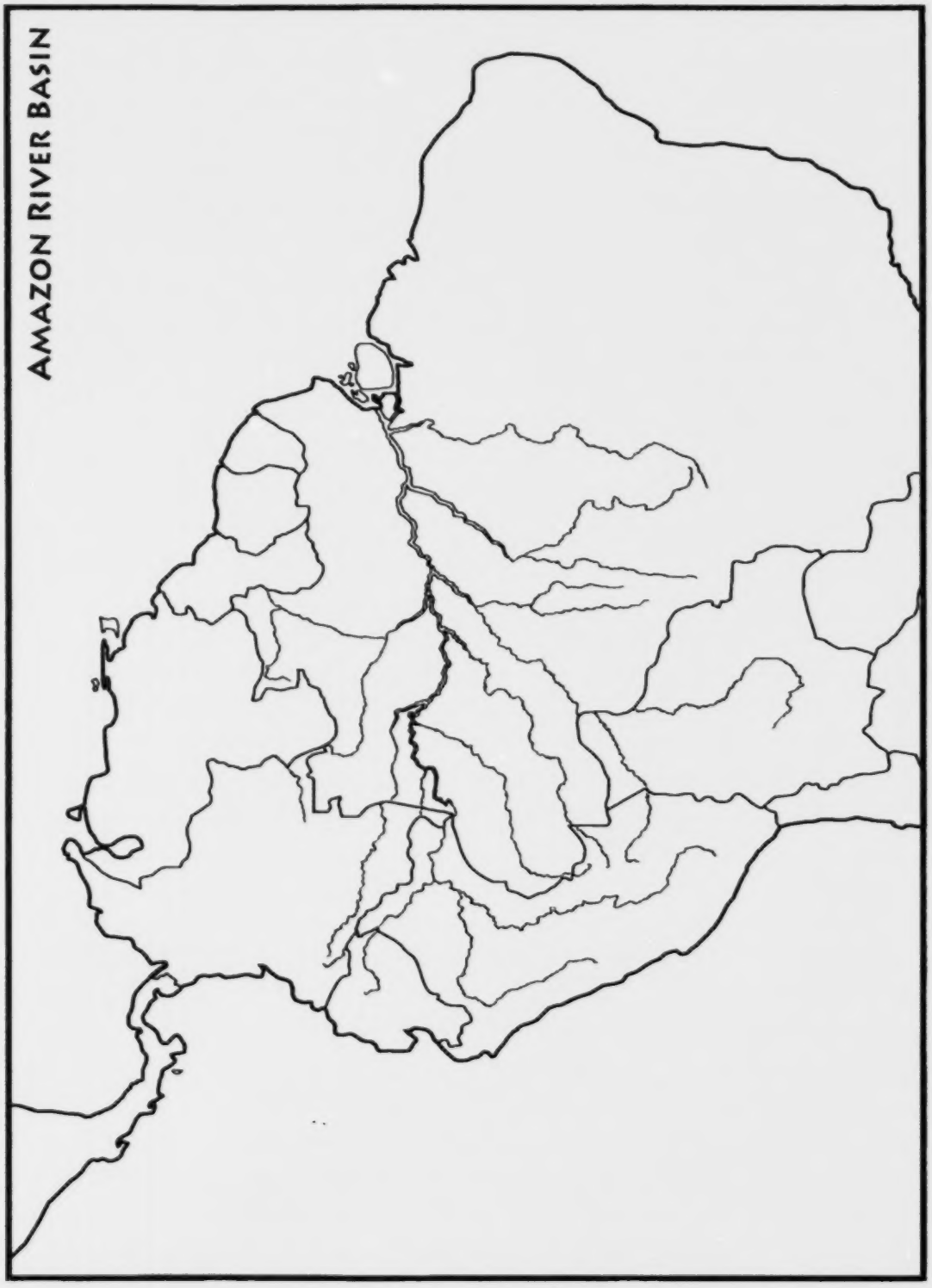

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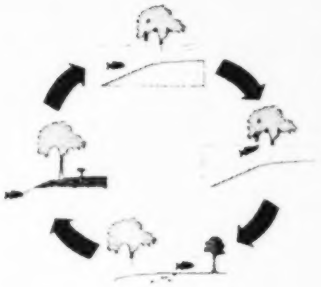
THE FLOODING CYCLE

In the Amazon, the pulse of life beats with the pulse of the river. Here, flooding has a positive impact on the entire environment. Six months wet, six months dry. Seasons in the flooded forest are marked by the rising and lowering water. This yearly cycle of flooding is what makes the flooded forest work ... and work well.

ACTIVITY 5

Explore the concept of natural cycles.



Have students brainstorm and explore what other natural things come in cycles. Examples include:

* the four seasons
* tadpole/frog/tadpole
* pinecone/tree/pinecone
* the water cycle

Using the four scenes on the next page, have each student color the sheet, cut the scenes and arrange them into a cycle. Building on that concept, have them brainstorm and draw other natural cycles.

ACTIVITY 6

Explore natural processes – like flooding and fire – that are usually thought of as "bad", but can actually be good.

Flooding is typically thought of as being "bad," yet in the Amazon, flooding is a good and necessary thing. Here in the Northwest, forest fires are another example of a "bad" natural process that can actually have positive results. Good fires happen when there are just enough dead leaves and branches on the ground to burn at a temperature that doesn't harm the larger trees. Without these "good" fires, branches and leaves pile up into a thick layer on the forest floor. Then, when a fire does start, there is so much fuel on the ground that the fire burns much hotter. This is bad because the fire burns so hot that the tall trees get burned down.

For this activity, divide the class into two groups. Have one group show the positive benefits of a forest fire through research, writing and drawing. What happens if good fire didn't clear out some of the forest floor? Have the other group show the positive benefits of flooding in the Amazon flooded forest through research, writing and drawing. What would happen if dams were built and the forest didn't flood? Finally, compare and contrast the benefits that come from flooding in the flooded forest and forest fires in the forest.

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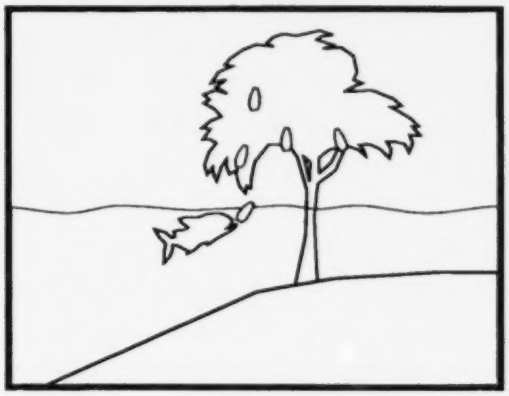
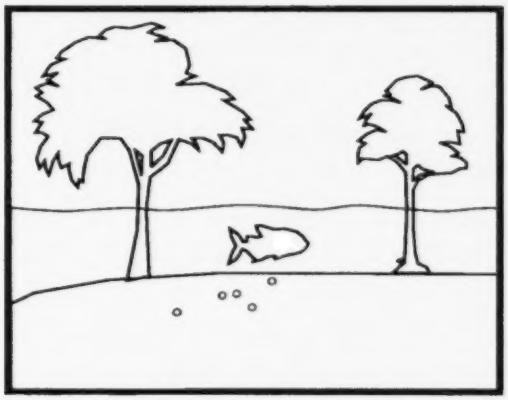
CREATE A CYCLE

Nature is filled with cycles. To make an Amazon flooded forest cycle, color the pictures below, then cut them out. Using your knowledge of the flooded forest, see if you can arrange the events in a circle to create a cycle. When you're done, see what other natural cycles you can create.

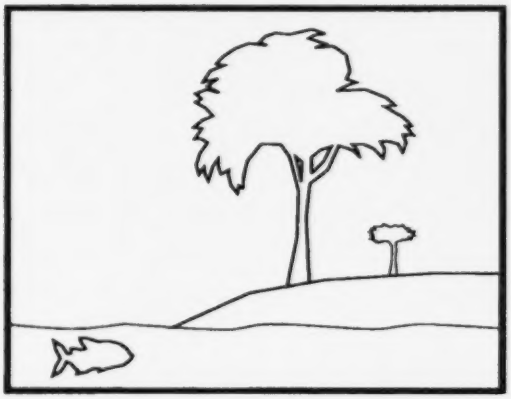


High-water season. Fish swim into the forest and eat fruit.

Rainy season begins. Water level rises.



Fish drop seeds throughout the forest.



Low-water season. Fish are in the river. New trees sprout.

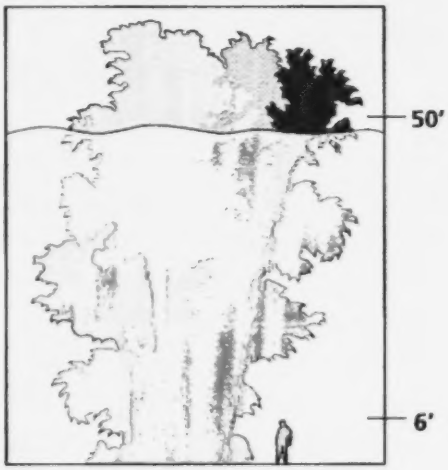
FALLING RAIN, RISING RIVER

More than 100 inches of rain can fall during flood season. Creeks, streams and smaller rivers all empty into the Amazon, creating an enormous flood basin. Areas that were once forest floor are quickly submerged, with water rising as much as 50 feet into the trees. Fish hunt among the tree-tops. Unlikely animals (like sloths) swim through the branches with ease. The flood is so large that the river overflows its banks and spreads out up to 30 miles on each side.

ACTIVITY 7

Utilize estimating and measurement skills to see how high the water reaches in the flooded forest.

For this activity, copy the worksheet on the next page for each student. Have the kids estimate the water level during flooding season. Using the person on the worksheet as a template, have kids cut out additional "people" to use as a measuring device. Then have the students stack the people up to the flood line to calculate how high the water rises during flood season.



ACTIVITY 8

Make an Amazon flooded forest rain stick.

Supplies: paper towel tubes, felt squares, thick rubber bands, chenille stems, uncooked rice

First, have kids decorate their paper towel tube using markers, glitter pens or colored tape. Next, put a felt square over one end of the tube and seal it tight using a thick rubber band (double it around the tube if you can). Loosely accordion fold the chenille stems and stuff them into the tube, then pour in a cup of uncooked rice. Finally, seal the other end with a felt square and another thick rubber band. To make it "rain," hold the rain stick in the middle and slowly turn it from side to side. This is a gentle rain, so encourage students not to shake or bang their rain sticks.

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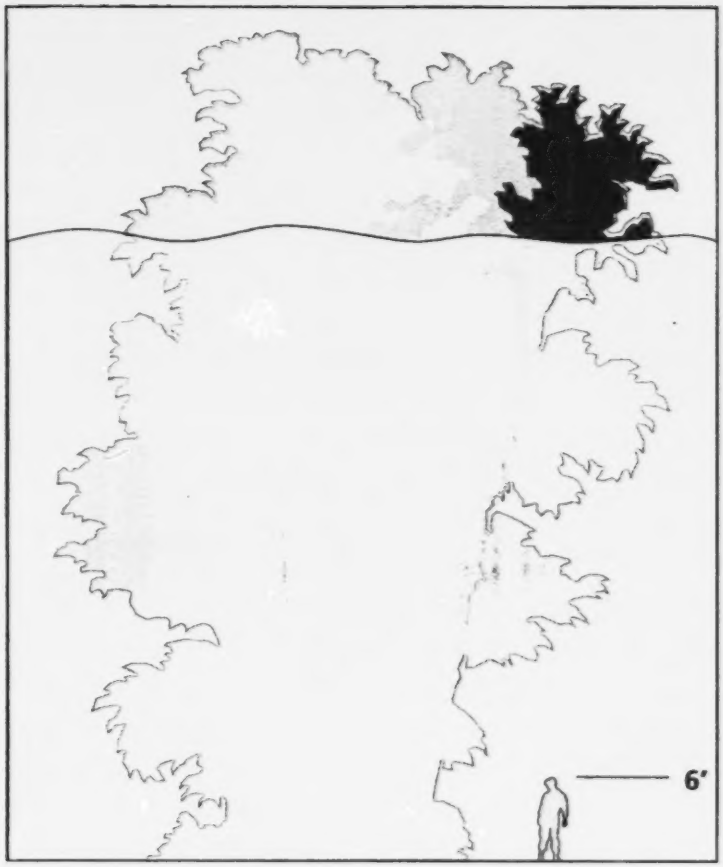
THIS RIVER RUNS DEEP!

During flooding season, the Amazon River spills into the forest. Water can reach high into the trees. Using the person on the forest floor as your guide, see if you can estimate — then measure — the water level during the flood.

Water level:

_____ estimate

_____ actual



WILD MEASUREMENTS

The Amazon is filled with impressive measurements — like a snake that's 26 feet long and weighs 400 pounds. But what do those numbers mean to a kid? Using the list below, try using different units of measurement to represent the original measurement. If a Brazil nut tree is 150 feet tall, for example, how many 4th graders would have to stand on top of each other to equal that height? How many candy bars, kickballs, school desks or lunchboxes would it take?

How long is a 26' anaconda? _____

How heavy is a 400 pound anaconda? _____

How small is a 6" pygmy marmoset? _____

How wide is 60 miles of flooding? _____

How deep is 50' of water? _____

How tall is a 150' Brazil nut tree? _____

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ANIMALS ON THE MOVE

As the floodwaters rise in the Amazon flooded forest, the animals begin to move. Insects and spiders go from the ground into the trees. Birds and monkeys who live in the lower part of the trees move higher into the canopy. As the river moves out of its channel and into the forest, fish, turtles and other river animals swim into the lower area of the canopy — an area that is now underwater.

Animals that typically live in the canopy must either compete for living space or move away from the area. So while these are good times for most animals, it can be difficult (and crowded) times for canopy dwellers.

ACTIVITY 9

Create an Amazon flooded forest habitat by placing animals where they live. Compare and contrast the same habitat during low-water season and high-water season.

Each student will need a total of four worksheets – two copies of the flooded forest scene and two copies of the animals page. On one of the flooded forest sheets, instruct your students to cut-and-paste the animals where they belong within the habitat during low-water season. On the other sheet, have them repeat the process to represent high-water season. Color the finished sheets. Once completed, compare the difference in animal habitats between low-water and high-water season.

ACTIVITY 10

Create an Amazon A-to-Z book.

Depending on your class, you can assign each student a letter of the alphabet, have each student create an entire alphabet book on their own, or have students work in cooperative learning teams to create their alphabet book. The idea is to end up with a large-size alphabet book of things related to the Amazon flooded forest.

The letter "F," for example, could stand for fish, forest or flood. Students can research their alphabet letter(s) using books, reference materials, software, videos or web sites. Again, depending on your class, letters can be as simple as a page or as complex as a written report with illustrations.
(Note: See the Word Find in this guide for a sample list.)

Once the individual letters are complete, bind the book(s) together to create an Amazon A to Z. Completed books can be shared via author visit, buddy read or class presentation. You could also turn each letter into a mini-poster and use your colorful alphabet to decorate a hallway or display case.

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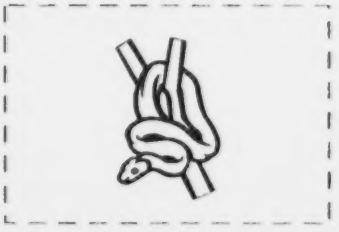
ANIMALS ON THE MOVE

In the Amazon flooded forest, a typical year is dry for six months and wet for six months. Using one set of sheets, paste the animals where they live when it's dry. Using a second set of sheets, paste the animals where they live when it's wet. Color both sheets, then compare and contrast the differences. Who moved? Who stayed put? Don't forget to show where the water's at during each season.

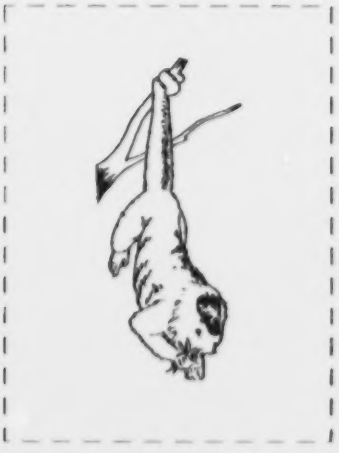
Answers on page 24.

Pacu



Emerald Tree Boa

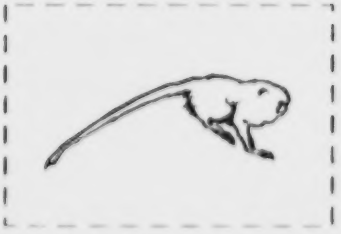
Poison Dart Frog



Howler Monkey

Sloth

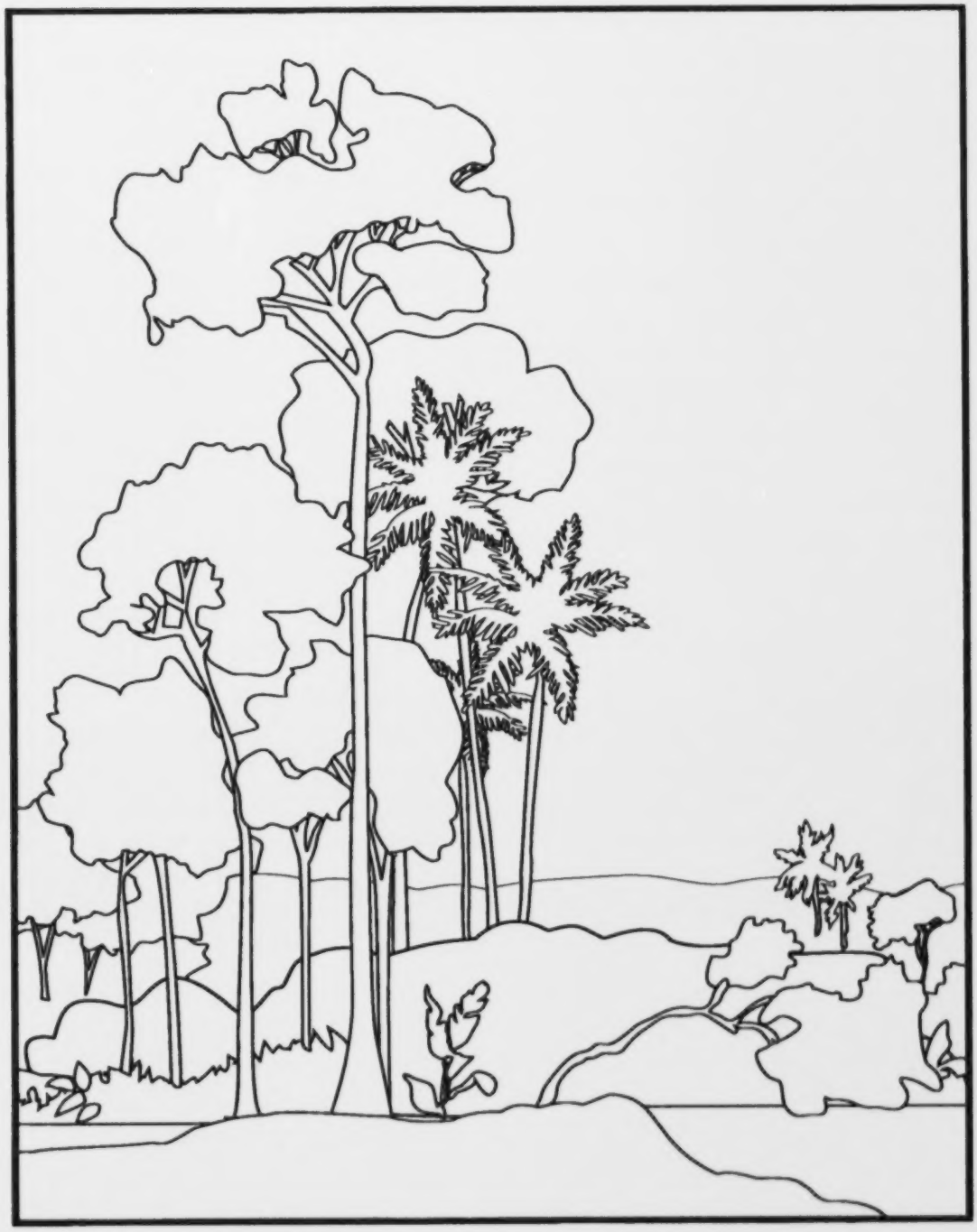
Swallow



Marmoset

Agouti

[ ] low-water season [ ] high-water season



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Amazon Flooded Forest Word Search

It's high water season in the Amazon flooded forest and everything is underwater. See if you can find all the things that help make this environment unique.

Adapting	Agouti	Amazon River	Anaconda
Angelfish	Arawana	Arrau Turtle	Brazil
Brazil Nut Tree	Brazilian Cockroach	Cardinal Tetra	Cycle
Diversity	Dwarf Caiman	Emerald Tree Boa	Flooding Season
Freshwater Stingray	Green Iguana	Howler Monkey	Interconnected
Low Water Season	Motmot	Pacu	Paradise Tanager
Poison Dart Frog	Pygmy Marmoset	Rainy Season	Red Tailed Catfish
Rising Water	Ron Ron	Saki Monkey	Sloth
South America	Swainson's Toucan		

F I E I L E E L T R U T U A R R A C I Z
O L E A R R E T A W G N I S I R V V R B
O V O N U D I V E R S I T Y C J D Y W T
D E Y A R E D T A I L E D C A T F I S H
C E A U I T L D A B A N A C O N D A Y N
H R R G T E S O M R A M Y M G Y P Z E O
A T T I S L O T H A R H U Z K A I N K S
I T E N E P S U S Z F K T C Q X A A N A
N U T E G H V Q C I Z K Y K A C V M O E
P N L E H A N G E L F I S H U P D A M S
O L A R A D A P T I N G P O I Q F Z R R
I I N G U A M Q H A M D T O X M S O E E
S Z I F L O O D I N G S E A S O N N L T
O A D R O N R O N C N M O T M O T R W A
N R R I N T E R C O N N E C T E D I O W
D B A C Y C L E S C A R A W A N A V H W
A S C A D J B N D K I T U O G A J E M O
R Y A R G N I T S R E T A W H S E R F L
T K W H E A V L N O S A E S Y N I A R B
F L A A W E M E R A L D T R E E B O A K
R G C S D W A R F C A I M A N Z O V T I
O B R A Z I L E U H S A K I M O N K E Y
G C T P A R A D I S E T A N A G E R G F
K D B L G B V A A C I R E M A H T U O S

ADAPTING TO THE SURROUNDINGS

Animals living in the flooded forest are perfectly adapted for their environment. The howler monkey defends its territory by screaming — the ideal "weapon" when floodwaters crowd more animals into less treetop living space. The unique eye structure of the arawana lets it look above and below the water at the same time — great when insects that were once high in the trees now cling close to the water. The pygmy marmoset has chisel-like teeth that gouge holes in tree bark, allowing it to lick the sweet sap underneath — a big advantage when flooding increases competition for food. From the smallest monkey to the largest rodent, one thing is certain: Adapting to the environment — wet or dry — helps each species in the Amazon survive.

ACTIVITY 11

Identify niches and adaptations for the animals in the Amazon flooded forest.

Using the worksheet on the next page, have students figure out where each animal lives and what special adaptation it has for the flooded forest environment.

To do so, give each student a single type of animal (mammal, reptile) to observe. Depending on your class, you could also have each student select an animal in each category, or have students work in small groups to complete the entire worksheet.

While at the zoo, students observe the animals and record the information on the worksheet. Information needed to complete the worksheet can come from observing the animals, by reading the exhibit text and by hypothesizing.

Agouti
Anaconda
Angelfish
Arawana
Arrau Turtle
Cardinal Tetra
Dwarf Caiman
Emerald Tree Boa
Freshwater Stingray
Green Iguana
Howler Monkey
Motmot
Pacu
Paradise Tanager
Poison Dart Frog
Pygmy Marmoset
Red Tailed Catfish
Saki Monkey
Sloth
Swainson's Toucan

ACTIVITY 12

Write a first-person story as one of the animals in the Amazon flooded forest.

Have each student select an Amazon flooded forest animal to become. Their mission: Write a first-person story from the point of view of that animal. Where do you live? What do you eat? Who tries to eat you? What do you do when the flood waters rise? Encourage them to be creative and have fun. Students can read their completed stories to the class.

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WHICH NICHE?

Every animal in the Amazon flooded forest has a specific job to do. Take the case of the Amazon insects. Some pollinate plants. Some keep other insects in check. And some, like the Brazilian cockroach, turn dead plant and animal matter into soil. Those are their niches. Using this chart, put an X in the box where the animal is found, or write a description of the animal's niche in the box where it would be found.

	Canopy	Forest Floor	Water
BIRD			
MAMMAL			
REPTILE			
INSECT			
FISH			
AMPHIBIAN			

DIVERSITY GALORE!

The Amazon flooded forest boasts an amazing diversity of plants and animals. How diverse is diverse? Scientists exploring a single tree in the rain forest found 72 species of ants and 650 species of beetles. By comparison, a typical tree in Oregon houses just a handful of ant and beetle species. Whether it's insects or birds, fish or mammals, every one of the thousands of species in the Amazon depend on the yearly cycle of flooding.

ACTIVITY 13

Explore, research and document a mini-ecosystem at school or home.

An ecosystem is an area where all the plants and animals work together. It can be as small as a puddle on the playground or as big as the Amazon flooded forest. With that in mind, give each student or pair of students a hula hoop and head outside. The area you're exploring can be grass, barkdust, rocks, wet areas or all of the above. Have the students spread out, then toss their hoops onto the ground. Wherever the hoop lands is that student's study area.

Provide each student with a hand lens and make sure they have paper and a pencil for recording their findings. Using the hand lens, have the students spend some time looking very carefully at the ecosystem within their hoop. Have them record everything they see — insects, plants, water, feathers, food, debris and so on. If appropriate, have them count what they see (number of insects, number of a single type of insects). If there is animal life in their hoop (ants, worms, etc.), have them record any activity, as well. Once your pre-determined time is up, head back to the room and have students graph or chart their results.

To take this activity one-step further, have kids repeat the same process at a local park and again at home. Have them chart the results from all three locations and compare the ecosystems.

ACTIVITY 14

Explore the concept of camouflage through creative thinking and art.

In the Amazon flooded forest, poison dart frogs are anything BUT green! Their wild coloring tells would-be predators that they are poisonous.

Using art supplies, enlarged copies of the frog illustration from the next page and lots of imagination, have your students design and color frogs that might live in other parts of the flooded forest. What would be the best camouflage for a frog who lives in water? On fruit? On the forest floor? On flowers? Along a muddy river bank? In dead leaves on the forest floor?

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Once completed, have each student show their newly camouflaged frog and explain their rationale to the class. Then use the frogs as part of your Amazon flooded forest room décor.

ACTIVITY 15

Pair an animal from the Amazon flooded forest with an animal from the Pacific Northwest.

True, we don't have howler monkeys or boas hanging from the trees, but we have animals that climb, animals that graze, animals that eat nuts, animals that live in families, animals that live inside rotted trees and so on.

Using copies of the chart, have students review the attributes and descriptions of the animals from the flooded forest. Then have them brainstorm to come up with an animal from our part of the world that best matches the Amazon animal. Along with filling in the blank boxes, have students prepare to defend their animal selections. How are the animals alike? Is it because of what they eat? Where they live? Special features? Family unit? What they look like? Sounds they make? The way they move? Research using reference books and web sites can also be incorporated as part of this activity. ***Answers on page 24.***

Flooded Forest Animal	Description	Northwest Animal
Agouti	Small mammal that eats nuts and seeds it finds on the ground.	
Arawana	River dwelling fish that leaps out of the water to catch insects.	
Poison Dart Frog	Amphibian that has bright colors to warn predators it is poisonous.	
Howler Monkey	Mammal that stays in the trees all year eating fruit and leaves.	
Brazilian Cockroach	Insect that turns dead plants and animal matter into soil.	

A FOREST INTERTWINED

The rise and fall of the water connects every aspect of life in the Amazon flooded forest. During the flood, the pacu swims deep into the forest, using its specially evolved teeth and jaws to eat fruit from the trees. The seeds pass through the fish's digestive system and are dispersed throughout the forest. The fish gets food, the forest gets trees and the entire system thrives — all thanks to the cycle of flooding.

ACTIVITY 16

Create a series of Amazon flooded forest food chains.

Using the worksheet on the next page, have kids read the clues and fill in the blanks to create a series of Amazon flooded forest food chains. When you're done, brainstorm with the class to see if you can make up additional food chains from the flooded forest.

To extend this activity for advanced classes, try taking the different food chains you create and weave them together to make a complex food web.

For this activity, start by putting the names of all sorts of flooded forest animals on individual index cards. Don't forget to include other parts of the web, like fruit from the trees, plant matter and Brazil nuts. Have each child select a card and tape it to their shirt. Using a ball of string, connect the parts of the food web to make an interactive web. Remember, there are LOTS of ways to connect a food web! Once the web is created, discuss how all the parts are interconnected.

ACTIVITY 17

Write a short Dr. Seuss-like story or poem about the flooded forest.

By now, your students will have an appreciation for some of the wonder of the Amazon flooded forest. This unique environment is filled with seemingly out-of-place things. Sloths that can't move on land swim free. Cockroaches look like tree bark. Fish swim through the treetops eating fruit. Frogs are bright blue and yellow and orange. Using that as your starting point, have students write a short Dr. Seuss-like story or poem about the wacky world of the Amazon flooded forest, then have them illustrate their writings. Once completed, students can read their stories aloud to the class or buddy read with an older/younger student.

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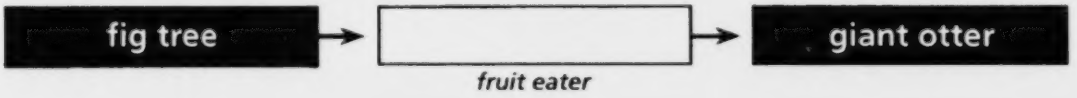
WHAT'S FOR LUNCH?

A food chain shows you who eats what — and who eats who — in an ecosystem. Every plant and animal forms a link in the chain. To complete the missing links in these Amazon flooded forest food chains, read the clue below each empty box. Then select the "link" from the bottom of the page that best completes each chain.

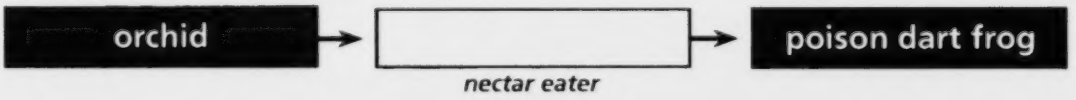
Answers on page 24.

CHAIN #1



fruit eater

CHAIN #2



nectar eater

CHAIN #3

makes new trees

CHAIN #4

treetop hunter

CHAIN #5

plant food factory

---

motmot
emerald tree boa
paradise tanager
pacu
leaves
arawana
bee
Brazil nut pod

PEOPLE OF THE FOREST

Water And People Flow As One

People living in the Amazon flooded forest use the river for every aspect of life — for drinking, cooking, washing clothes and bathing. They catch fish from the river for dinner and use its water as their main roadway. The Amazon is the lifeblood of the forest.

Houses are built on stilts to stay above the rising water. Roofs are made from palm thatch, woven tightly to keep out the rain. Palm twine holds logs together. When it's time for bed, floor mats and hammocks are surrounded with mosquito netting to help block out the bugs.

People of the Amazon farm when the water is low and fish when the water is high. During flood season, a canoe is the main mode of transportation.

ACTIVITY 18

Write a first-person journal or diary page about life in the Amazon flooded forest.

First, discuss the unique first-person writing style found in a personal journal or diary. Next, tell the students that they will be putting themselves in the shoes of someone who lives in the Amazon flooded forest. To add to the experience, crinkle up a heavy tan paper towel or use a crumpled piece of brown kraft paper to simulate bark for the journal pages. Then have the kids create their page or pages. To extend this activity, you could have students write a different journal/diary entry each day for a week (or longer), then bind the pages together with a cover.

ACTIVITY 19

Make a ron-ron, a traditional toy for kids in the Amazon.

Supplies: 18" to 20" piece of cotton string, penny-sized button with at least two holes

Thread the string through one hole in the button. Turn that end of the string around and thread it back through the second hole. Tie the two ends of the string in a knot. Hold the knot in one hand and pull the string tight with the other hand. Make sure the button is in the middle.

With palms up, slip the ends of the string loop over a finger on each hand. The string should sag a little. Hold one hand still while you make a fast cranking motion with your other hand.

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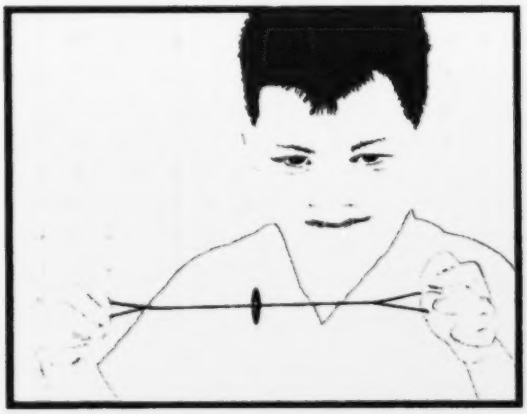

This will twist the string. Once the string is tightly twisted, hold both of your hands in front of you, then pull them far apart. This will make the ron-ron spin. Quickly pump your hands back towards the button, like you are clapping, without having your hands touch. Then pull your hands apart again. The string should twist and untwist. Continue to pump your hands quickly in and out. The button will spin and start to whir.

ACTIVITY 20

Compare and contrast life here with life in the Amazon flooded forest.

Have the students compare and contrast their lives with the lives of the people living in the Amazon flooded forest. Use brainstorming, diagrams, art, writing and other compare and contrast methods. Areas to discuss include houses, food, transportation, earning a living, weather, environment, entertainment and school.

AMAZON VOCABULARY WORDS

Here's a list of vocabulary words your students may not be familiar with. When looking up definitions, look for meanings that best apply to the Amazon flooded forest.

Adapt
Camouflage
Cycle
Diversity
Ecosystem
Flood
Intertwined
Niche
Sustainable

For a child's-eye view of life in the flooded forest, read "My Amazon River Day" by Kris Nesbitt

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BUY A FISH, SAVE A FOREST

How can buying a tiny aquarium fish help save the rain forest? Take the case of the cardinal tetra. People of the Amazon gather and export these colorful fish for use in aquariums. Through sustainable fishing, residents are able to earn a living without harming the forest. By buying only wild-caught cardinal tetras, you play a role in preserving the Amazon flooded forest.

ACTIVITY 21

Raise cardinal tetras in your classroom.

Set up an aquarium in your classroom and stock it with cardinal tetras and other sustainably raised fish from the Amazon flooded forest. Talk about how your purchase has a positive impact on the people and area of the Amazon flooded forest.

ACTIVITY 22

Discuss positive ways to use the flooded forest.

Bring in a bag of Brazil nuts to share with the class. While you're enjoying this Amazon flooded forest crop, brainstorm different ways the flooded forest could be used to create income for people of the area. When you're finished, divide the suggestions into two categories: helps the forest, hurts the forest. Discuss why some activites help the forest while others hurt it.

ANSWER KEY

Page 13 – **Animals On The Move**
Howler Monkey: stays in the forest canopy but moves higher into the canopy during flood season.
Poison Dart Frog: lives in the canopy all year round.
Emerald Tree Boa: lives in the canopy all year round.
Pacu: lives in the river during low-water season but swims out into the forest during high-water season.
Agouti: lives on the forest floor during low-water season and migrates away as the river rises.
Swallow: flies high above the canopy during low-water season and migrates away to places like Oregon & Washington during the high-water season.
Sloth: stays in the tops of trees all year round.
Marmoset: lives in low trees & bushes during low-water season but must migrate up into the canopy during high-water season.

Page 19 – **Amazon/Pacific Northwest animal chart**
Agouti: mouse, squirrel; **Arawana:** trout, salmon; **Poison Dart Frog:** rough skinned newt (salamander with bright orange belly); **Howler Monkey:** trick question – no trees in Pacific Northwest keep their fruit and leaves all year long so there can be no animal that is the equivalent in our Pacific Northwest forests; **Brazilian Cockroach:** millipedes, pill bugs and other insects that are decomposers

Page 21 – **What's For Lunch?**
Chain #1: pacu, **Chain #2:** bee, **Chain #3:** Brazil nut pod, **Chain #4:** emerald tree boa, **Chain #5:** leaves

Page 25 – **Who's Who In The Amazon Flooded Forest?**
pygmy marmoset, poison dart frog, arawana, cardinal tetra, sloth, anaconda, piranha

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Who's Who In The Amazon Flooded Forest?

Using the clues below, see if you can name some of the plants and animals that call the flooded forest home.

I have brown fur, I use my special teeth to get sap from inside trees and I fit in the palm of your hand.
Who am I? _____

I come in yellow, orange and blue. My bright colors tell the other animals that I'm poisonous — so they won't try to eat me.
Who am I? _____

I can jump several feet out of the water to grab insects on the tree branches. My eyes each move on their own.
Who am I? _____

I'm a small, clear fish with a splash of red. People of the Amazon harvest me for use in aquariums all over the world.
Who am I? _____

I eat leaves for 12 hours a day, then sleep for the other 12 hours. I hang upside down from the trees and rarely move.
Who am I? _____

I grow up to 26 feet long and can weigh as much at 400 pounds. I spend most of my time slithering in the water.
Who am I? _____

I have razor-sharp teeth and am known for my strong jaws. I don't bite people but I bite other fish.
Who am I? _____

TEACHER RESOURCES

BOOKS

- Amazon Alphabet by Martin Jordan
- At Home In the Rain Forest by Diane Willow
- Bats, Bugs and Biodiversity by Susan Goodman
- The Brazilian Rain Forest by Alexandra Siy
- The Great Kapok Tree by Lynne Cherry
- Jaguar by Roland Smith
- The Rain Forest by Alan Baker
- So Say the Little Monkeys by Nancy Van Laan
- Tales From the Rain Forest by Mercedes Dorson
- A Walk In the Rain Forest by Joy Pratt

SPECIAL BOOKS

- Amazon Rising: Seasons of the River and My Amazon River Day are both available from the Shedd Aquarium in Chicago.

VIDEOS

- Amazon: Land of the Flooded Forest
  — National Geographic Video
- The Great Kapok Tree
  — McGraw-Hill School Publishing

WEB SITES

- Amazon Interactive
  — www.eduweb.com/amazon/html
- Animals of the Rainforest (by a 6th grade class)
  — www.animalsoftherainforest.org
- Journey Into Amazonia — Waterworlds
  — www.pbs.org/journeytoamazonia/waterworlds/ html
- Rainforest Alliance: For Kids & Teachers
  — www.rainforest-alliance.org/kids&teachers/index.html
- World Wildlife Federation: Amazon River and Flooded Forests
  — www.worldwildlife.org/wildworld/profiles/g200/g147.html

PLACES TO VISIT

- Oregon Zoo Amazon Flooded Forest exhibit
  4001 S.W. Canyon Road * Portland, OR 97221
  (503) 226-1561
  www.oregonzoo.org
- World Forestry Center
  4003 S.W. Canyon Road * Portland, OR 97221
  (503) 228-1267
  www.worldforestry.org
- Hoyt Arboretum
  4000 S.W. Fairview Blvd. * Portland, OR 97221
  (503) 228-TREE
  www.hoytarboretum.org
- Forest Park
  2960 N.W. Upshur * Portland, OR 97210

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FIELD TRIP QUESTIONS

These chaperone-friendly questions are designed to promote conversation as you lead your group of kids through the Amazon flooded forest exhibit at the Oregon Zoo. Have fun!

Q. What do you think it looks like in the flooded forest?

Q. Can you find a snake that lives in the trees? Why would it live there?

Q. Why do you think those frogs have such wild coloring?

Q. Can you imagine living in a place with all this water? What would you like best about living there? What would you miss the most from your life here?

Q. How many different kinds of animals can you find? Why are the animals who live in this exhibit together?

Q. Which animal is the most colorful? Why?

Q. Which animal is the hardest to find? Why?

Q. Which animal is the largest? Which animal is the smallest?

Q. Which of these animals would you like to be? Why?

Q. Watch the sloth for a minute or two. How fast does it move? Can you explain why?

Q. How many kinds of monkeys can you find? How are they the same? How are they different?

Q. Would you like to live in this house? Why or why not? How do people in the flooded forest get around? How do they get what they need for everyday living?

Q. Can you find all the colors of the rainbow somewhere in the Amazon flooded forest exhibit?

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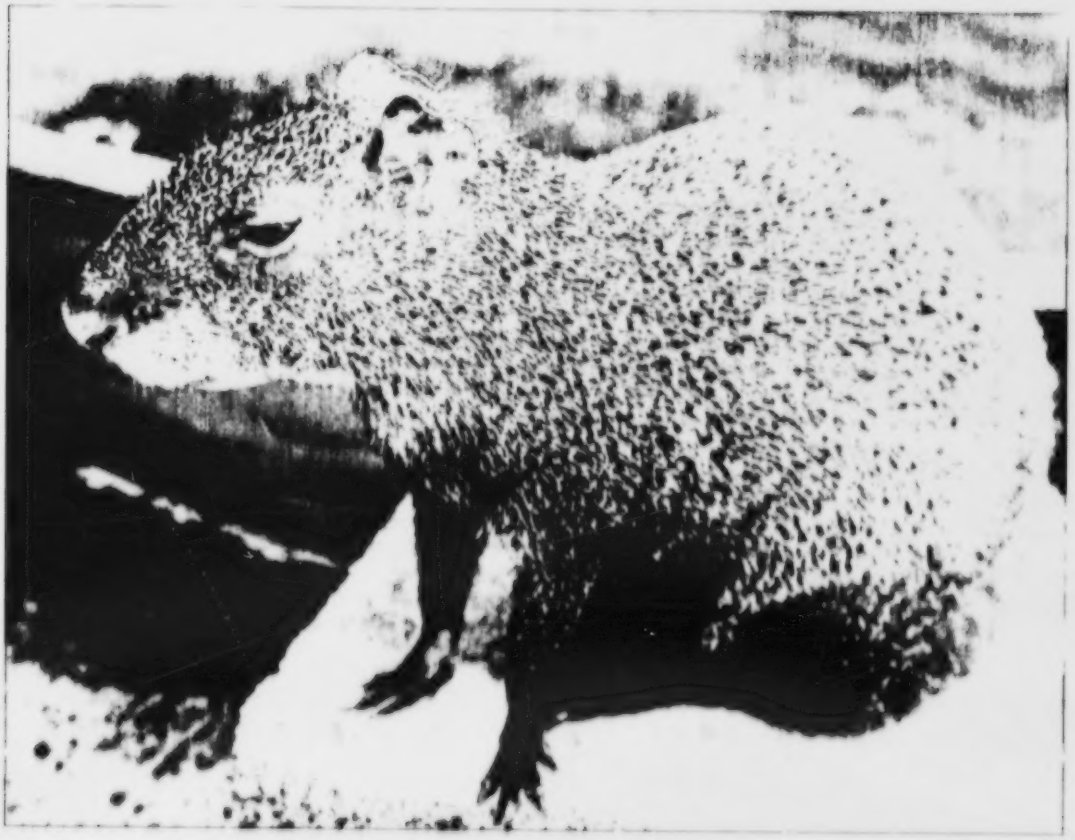

OREGON ZOO

Metro Regional Services
Creating livable communities

Written by: Todd Duvall

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